



## CroEcho 2011. — Naknadno pristigli sažeci simpozija

## CroEcho 2011 — Late submitted symposium abstracts

### MRI u dijagnostici bolesti srčanog mišića

### MRI in the diagnosis of heart muscle

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Primary cardiomyopathies (CMP) are diagnosed by exclusion of other cardiac diseases. Secondary cardiomyopathies are defined as distinct myocardial diseases with specific origin as ischemic, hypertensive, inflammatory. The identification of the etiology from a non-ischemic cardiomyopathy is often difficult. Common tests often produce a clear diagnosis, but in some cases establishing a diagnosis of cardiomyopathy can still be difficult and may be not possible to do with certainty. CMR can give information on cardiac anatomy, function, tissue characterization, perfusion, and valvular flow. This examination helps to determine the etiology and presence of disease for a cardiomyopathic process, and also provides an imaging tool to follow patients over time and provide prognostic information.

We will present our experience in diagnosis of nonischemic cardiomyopathies with magnetic resonance imaging mostly based on morphology changes.

### Hipertrofijsko remodeliranje miokarda

### Hypertrophic myocardial remodeling

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Ehokardiografija ima ključnu ulogu u svakodnevnom dijagnostičkom pristupu i procjeni hipertrofičnog miokarda. Međutim, rutinska procjena hipertrofijski remodeliranog miokarda pomoću globalnih geometrijskih mjera funkcije lijeve klijetke (LK) jednodimenzijom (M-prikaz) ehokardiografijom može biti zavaravajuća. Sistolička funkcija se često smatra očuvanom u bolesnika s hipertrofijskim miopatijama do kasno u tijeku bolesti, a smatra se i da takva stanja globalno zahvaćaju miokard, tj. difuznije nego ishemijska bolest srca. Deformacijsko oslikavanje ehokardiografijom, bilo Dopplerskim oslikavanjem miokarda (Doppler myocardial imaging) ili dvodimenzijom strain (speckle tracking), pruža uvid u regionalni pomak i deformaciju miokarda, pružajući osjetljive biljege rane disfunkcije miokarda. Bazična i klinička ispitivanja koja primijenjuju ove metode otkrila su da hipertrofijske miopatije predstavljaju heterogenu skupinu bolesti sa zahvaćanjem specifičnih regija miokarda.

Fiziološko hipertrofijsko remodeliranje koje se javlja u sportaša razlikuje se od patološke hipertrofije miokarda koja može biti odraz kompenzatorne reaktivne hipertrofije

Echocardiography plays a leading role in the routine diagnostic approach to the assessment of hypertrophic ventricles. However, the routine assessment of hypertrophically remodelled myocardium by M-mode based global geometric measurements of left ventricular (LV) function may be misleading. Often, systolic function is considered preserved in patients with hypertrophic myopathies until late in the disease course and hypertrophic myopathies are thought to affect the myocardium globally, i.e. more diffusely than ischemic heart disease. Ultrasound deformation imaging, either employing Doppler myocardial imaging or speckle tracking, provides insight in regional myocardial motion and deformation, offering sensitive markers of early myocardial dysfunction. Basic and clinical studies that apply these techniques have revealed that hypertrophic myopathies represent a heterogeneous group of diseases with specific myocardial regions affected.

Physiological hypertrophic remodelling detected in athletes differs from pathological myocardial hypertrophy, which can be caused by compensatory reactive hypertrophy owing to pressure overload in patients with aortic steno-



kao posljedice tlačnog opterećenja u bolesnika s aortnom stenozom ili hipertenzijom, ili pak amiloidoze ili Fabryjeve bolesti. Tlačno opterećenje tipično u hipertenzivnoj bolesti srca prvenstveno zahvaća bazalni septum, dok sistemske kardiomiopatije koje induciraju hipertrofiju (poput Fabryjeve bolesti) zahvaćaju slobodnu stijenku LK. Nasuprot tome, u hipertrofijskoj kardiomiopatiji zahvaćenost segmenta je individualna u pojedinim skupina bolesnika (najčešće, međutim, zahvaća interventrikulski septum), dok amiloidoza zahvaća miokard difuzno. Nadalje, funkcijsko (sistolicko) oštećenje najčešće primarno zahvaća longitudinalna vlakna miokarda te rutinska procjena radijalne funkcije može zamaskirati ranu fazu bolesti miokarda.

Različite etiologije koje dovode do hipertrofije miokarda pokazuju specifične uzorke zahvaćenosti regionalne deformacije, što može razlučiti hipertrofijski proces i poboljšati procjenu i praćenje liječenja. Konačno, procjena sistoličke funkcije u hipertrofijskim miopatijama ne bi trebala biti manje važna od procjene diastoličke (dis)funkcije, već integrirana u sveobuhvatni pristup hipertrofiji LK i ranoj detekciji funkcijskog oštećenja miokarda.

sis or hypertension, as well as e.g. amyloidosis or Fabry disease. Pressure overload typical for hypertensive heart disease mainly affects the basal septum, while systemic cardiomyopathies that induce hypertrophy (such as Fabry disease) affect the LV free wall. Conversely, hypertrophic cardiomyopathy shows patient-specific abnormal segments (most often, however, affecting the interventricular septum), while amyloidosis affects the myocardium diffusely. Moreover, functional (systolic) impairment most often primarily affects the longitudinal myocardial fibers and routinely performed assessment of radial function might mask the early onset of myocardial disease.

Different aetiologies leading to hypertrophy demonstrate specific signatures in regional deformation, which can discriminate the hypertrophic processes and improve the assessment and follow-up of treatment. Finally, the assessment of systolic function in hypertrophic myopathies should not be secondary to the assessment of diastolic (dys)function, rather integrated in a comprehensive approach to LVH and early detection of myocardial functional impairment.

## Uloga ultrazvuka u postupku transkateterske implantacije aortnog zalistka

## The role of echocardiography in process of transcatheter aortic valve implantation

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**T**ranskateterska implantacija aortnog zalistka (TAVI) predstavlja novi način liječenja starijih bolesnika s teškom simptomatskom stenozom aortnog zalistka, koji imaju visoki pretpostavljeni rizik za klasičnu operaciju (*Logistic Euroscore* viši od 20% ili *STS score* viši od 10%).

Ehokardiografske metode (TTE i TEE) koriste se u svim stadijima TAVI postupka, prije i nakon zahvata. Ultrazvukom se postavlja dijagnoza teške aortne stenoze. Ultrazvuk je metoda kojom se, na temelju mjerenja zadanih anatomskih / morfoloških karakteristika aortnog zalistka i korijena aorte, probiru bolesnici (načelno optimalni za TAVI).

Ultrazvukom se može koristiti "za navođenje" u samom TAVI postupku, a njime se neposredno postproceduralno otkriva funkcionalni status zalistka (npr. postojanje i stupanj regurgitacije).

TTE i TEE konačno, detektiraju moguće komplikacije, a naknadno se njime tretirani bolesnici prate.

Kroz sve navedene stadije TAVI-postupka, ehokardiografija je metoda komplementarna ostalim slikovnim tehnikama.

Uvažavajući navedeno, prikazana su iskustva tijekom ehokardiografske obrade kohorte od 10 bolesnika kojima je dosada u Bolnici Magdalena, od siječnja 2011. godine, učinjena TAVI.

**T**ransthoracic (TTE) and transoesophageal (TOE) echocardiography, both are used through all steps of TAVI procedure, before and after the operation.

The diagnosis of the severe aortic stenosis is made by echocardiography.

Echocardiography allows appropriate patients election, based on measurements of defined anatomical and morphological characteristics of the aortic root.

Finally, echocardiography could be used as a "procedural TAVI guidance", as it can assess the function of the implanted valve, immediately after the operation (for instance, aortic regurgitation).

Postprocedural complications are also detectable by TTE / TOE, while the follow-up of the treated patients is easily made by echocardiography, as well.

Transthoracic and transoesophageal echocardiography are both complementary to the other imaging techniques, used during TAVI procedure.

Taking into account the above, we presented our results and impressions, while using echocardiographic techniques over the cohort of already 10 TAVI-treated patients in Hospital Magdalena, started at the January of 2011.